

RESULTS REGARDING THE APPLICATION OF THE MECHANICAL MILKING AT THE LOCAL SHEEP BREEDS

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Abstract

The purpose of work was to make and experiment a mechanical installation of milking which to be adequate to the sheep breeds from our country with aptitudes for the milk production, to elaborate a technology of mechanical milking and o establish the solutions for sanitary protection of the milk from gathering to processing.

The important advantage of the mechanical milking application is to assure the food quality and safety of the sheep milk, a requirement of the European standards regarding the quality of food products for the protection of the consumers, assuring economical efficiency to the exploitations and opening opportunities for valuating the products at export.

Key words: milking, sheep, installation

INTRODUCTION

The Romanian policy regarding the assurance of food quality and safety is that to align to the EU requirements in the field of food industry, which implemented the HACCP system on the technological flux of producing the sheep milk and processing the milk products.

The necessity to introduce and spread the mechanical milking at the sheep species isa requirement imposed by the norms of European Union, taking into account the fact that through hand milking the milk can get impurities easier, influencing the quality of products obtained by processing.

At present, in the world, the mechanical milking has spread out to the breeds specialized for the milk production due to its advantages: obtaining a hygienic milk, reducing the cases of marmite (favoured by the milk retention and by the bad conditions of hygiene on hand-milking), increasing the milk production with 15-20% (developing the conditioned reflexes due to a rapid and milking), reducing the consume of labour force and increasing the productivity of work.

MATERIAL AND METHODS

The experiment was made on 6 sheep lots of Milk Breed-Palas, Prolific Line-Palas,

Țigaie Breed (Țigaie from Transylvania, Țigaie from Moldavia and Brown Țigaie) and Țurcană breed.

When making the experimental lots it was made a visual appreciation by palming the udder with the purpose to exclude the sheep that have udders which do not correspond in the structural point of view, which have affections or trashes from previous diseases.

It was aimed to determine the quantity of milked milk with the mobile aggregate, the duration and speed of milking.

The fixed milking machines need milking rooms, especially equipped and they are used in big sheep exploitations (over 500 sheep in lactation).

The installations for sheep are of rotating type on which the milking is made in continuous flux and of linear type, with the sheep placed on both sides of a channel, having 12, 24 and 48 milking places, on one or two rows. Those with 24 and 48 places with the sheep placed on two rows allow the milking process in continuous flux (after finishing the milking at a row of sheep the milking machines are detached and attached at the 2nd row, while the milked sheep are retired and another lot is placed instead).

The milking of sheep on one row begins with the attachment of the milking machines initially at the sheep with odd number and after the machine was attached to the last sheep on the row, the machine will be attached to the other sheep.

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After attaching the machine at the last sheep the machines are attached to the second row beginning with the sheep with odd number again, the technologic process, being developed as with the first row.

The main technical characteristics of the installation for mechanical milking are the following:

- Type of installation—fixed platform with collective contenting;
- Number of milking places – 48 (2 x 24);
- Width of a milking place – 33 mm;
- Dimensions of the feeding pipes for concentrated fodders:
-length – 7300 mm;
-width – 200 mm;
-depth – 75 mm.
- type of vacuum pump – V D – 76:
- Rotation – 110 rot. /min;
-Debit – 900 NT/min;
- Nominal vacuum – 380 mm/cal MC;
- Engine power– 2.2 k w.
- type of milking machines– in two temps;
- Number of the milking machines – 12 pieces;
- Rapport of temps– 281;
- Frequency of pulsar – 88 pulsations/min.;
- Control of milk jet– visual through collector;
- Length of milking glass– 102 mm;
- interior diameter of the milking glass– 29 mm;
- length of muff– 106 mm;
- the interior superior diameter of the muff – 20 mm;
- Type of pulsar– hydro-pneumatic.

The installation was provided with the following components:

- Mobile platform on wheels;
- Device of de contenting the sheep, folding and provided with foddering pipe;
- Platforms for taking the sheep up and down from the milking platform;
- Group for producing the vacuum and the generator of pulsations;
- Equaliser of vacuum;
- Pipes for vacuum;
- regulator of vacuum with vacuum-meter;

- milking machines;
- hoses for milk and pulsations;
- amplifiers of pulsations;
- milking buckets.

The main functional parameters of the installation were:

- power of the electric engine – 1.5 kW;
- input tension – 220 V;
- number of milking places – 12;
- number of milking machines – 6;
- number of buckets – 3;
- type of vacuum pump – EPV-O;
- rotation of pump– 920 rot./min.;
- level of vacuum – 42 ± 1 kpa;
- type of pulsar– mechanical - pneumatic;

The system of contenting is designed for the immobilization of the sheep to be milked and fed with concentrated fodders.

The installation of milking makes the extraction of milk and collects it in graded cylinders, which are individual for each milking machine to control the milk quantity which was extracted from each sheep and transporting it through the central glass pipe to the collecting room.

At ICDCOC Palas-Constanța was experimented a mobile installation of milking provided with 12 places for milking.

RESULTS AND DISCUSSIONS

On the basis of the visual appreciation of the udder according to the methodology of selection of sheep in order to form the lots for mechanical milking, 30 sheep from the Milk Population -Palas, Țurcană breed and Țigaie breed were selected.

The average milk quantity obtained at a milking is an important criterion in establishing the appropriateness of sheep for mechanical milking.

The mechanical milking of sheep is efficient at the quantity of milk of 300 ml at a milking.

The average milk quantities obtained at a milking from the sheep of Milk breed-Palas and Prolific Line with the mobile aggregate are presented in the following tables:

Table 1 The variation of the average production obtained at one milking at the sheep of Milk Breed – Palas

Nr.	Specification	Quantity of milk (ml)			
		300-350	351-400	401-450	451-500
1.	Number of sheep	11	11	2	6
2.	%	36,7	36,7	6,6	20

From the analysis of the data presented in table 1 it results that the majority were the sheep with a production of 300-400 ml, meaning a total of 72% and at the sheep with the production of 400-500 ml the percentage being of 26%.

To experiment the mechanical milking at the sheep from Prolific Population-Palas a lot of 30 sheep was formed through selection. The average milk production obtained at the morning and evening milking is presented in table 2.

Table 2 The variation of the average production obtained at one milking at the sheep of Prolific population - Palas

Nr.	Specification	Quantity of milk (ml)			
		300-350	351-400	401-450	451-500
1.	Number of sheep	18	8	2	2
2.	%	60	26	6	6

From the data presented in the table it results that the majority is sheep with the production of 300 and 400 ml, being 86% and only 12% those with productions between 450 ml and 500 ml.

Analyzing comparatively the average milk productions obtained at one milking from the two populations it results an insignificant difference.

The experimentation of the installation on Țigaie breed was made on lots of 30 sheep, the obtained data being presented in table 3.

Table 3 Duration of milking and the milk quantity obtained at Țigaie Breed

Sheep breed	Number of sheep (heads)	Effective time (minute)	Total time (minute)	Milk quantity (litres)
Țigaie of Covasna (Transylvania Plateau)	30	20.40	31.25	9.300
Brown Țigaie (Moldavia Plateau)	30	19.30	29.45	8.400
Brown Țigaie (Middle Sub-Carpathians)	30	21.00	32.00	9.100

From the comparative analysis of the obtained data at the 3 variants of Țigaie breed it can be noted that the maximum limits were registered at Țigaie of Covasna and Brown Țigaie from the area of Middle Sub-Carpathians at which the extracted milk quantity was bigger, of 9.1-9.3 litres comparatively to the quantity of milk

obtained from Țigaie breed from Moldavia Plateau at which the quantity of milked milk was of 8.4 litres.

The duration of the mechanical milking and the quantity of milk extracted at the sheep breeds of Țurcană and Țigaie from the plateaus of Transylvania, Moldavia and Brown Țigaie are presented in table 4.

Table 4 Duration of mechanical milk and the milk quantity extracted from the sheep breeds of Țurcană and Țigaie from the Plateaus Transylvania, Moldavia and Brown Țigaie

Specification	UM	Breed			
		Țurcană	Țigaie Transylvania Plateau	Țigaie Moldavia Plateau	Brown Țigaie
Number of sheep	head	20	20	20	20
Total duration of milking	min	21	19.20	20	18
Effective duration of milking	min	13.20	12	11.30	10.40
Obtained milk quantity	litres	7.200	7.600	7.900	6.500

From the analysis of the data presented in the table it results that the total time of mechanical milking on the ground of a lot of 20 sheep varied between 18 and 21.40 minutes depending on the extracted milk quantity and breed. So, at Țigaie breed from Moldavia plateau the total duration of milking the lot was of 20 minutes, from which it was a quantity of milk of 7,900 litres, while at Țurcană breed, the duration of milking was of 21 minutes and a smaller quantity of milk was obtained, of 7,200 litres

The milking machines were appropriate in the point of view of the nipples at all breeds.

CONCLUSIONS

The advantage of applying the mechanical milking consists in assuring the food quality and safety of the milk sheep, a requirement of the European standards regarding the quality of the food products for protecting the consumers' health.

Applying the mechanical milking in sheep exploitations, preserving the milk in cooling tanks, pasteurization and applying the system [6] of preventing the potential risks on the way of sheep milk, including in the processing phases, assures a certain economical efficiency of the exploitations and opens the perspective of valuating the diary products for export.

By introducing and spreading the mechanical milking at sheep the consume of labour force can be reduced because a single worker is necessary, comparatively to the hand-milking when at 2 milking workers it is necessary another worker who will guide the animals (the necessary of labour force is bigger with 50%).

The quantity of milk mechanically extracted was with 18 % bigger than at hand-milking.

By applying the mechanical milking, the microbial quantity is reduced to 20000 micro organisms/ml as they are in the milk at hand-milking, to 5500 micro organisms/ml at mechanical milking.

As a result of increasing the quantity of milk obtained through mechanical milking with 18 % in exploitation with 100 milking sheep it is obtained a supplementary quantity comparatively to the hand milking of 1000 litres of milk in the lactation period.

As a result of experimenting the installation of mechanical milking it was noted the fact that the sheep of local breeds of milk are suited to the mechanical milking.

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